

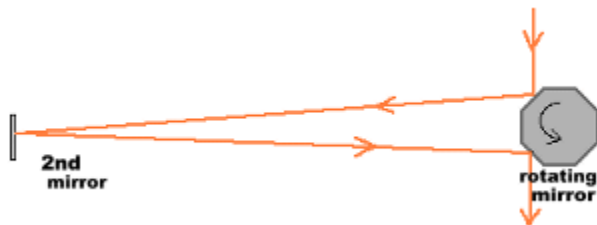
Measuring the Speed of Light

One of the earliest attempts to measure the speed that we know of was made by **Galileo** in the 1600's. He used the simple method of trying to time how long a beam of light would take to travel a known distance.

He equipped himself and an assistant with lanterns that had shutters that would open, letting the light out. His assistant stood on a hill several miles away. Galileo opened the shutter, letting a beam of light travel toward his assistant. That person opened his lantern the instant he saw the light, sending a beam back to Galileo. The time lag between Galileo first opening the shutter, and eventually seeing the return beam, was supposed to enable him to calculate the speed of the light.



Over the years, many other scientists tried unsuccessfully to determine the speed of light, however, it was not until 1879 that a scientist named **Michelson** succeeded. His apparatus consisted of a rapidly rotating hexagonal mirror, and a second mirror on a mountaintop, 35 kilometers away, as shown below:



Michelson's method was to shine a light on the rotating hexagonal mirror, which then reflected to the other mirror. The light reflecting back from this second mirror struck another face of the octagonal mirror, and could then be seen by an observer. The mirror needed to make one-eighth of a rotation in the time it took the light to make the return trip. This meant that the octagonal mirror had to be turning at about 32 000 rpm. From the round trip distance the light travelled, and the period of rotation of the octagonal mirror, the speed of light was determined quite accurately.